FORM PTO-1083/Modified

IBM Docket No. JA9-96-088
(PATENT)

In re application of: T. Chikazawa et al.
Serial No.: 09/049,861
Filed: 03/27/98
For: DISK DRIVE DISK WITH LANDING ZONE HAVING TEXTURED AND UNTEXTURED REGIONS

THE COMMISSIONER OF PATENTS & TRADEMARKS
WASHINGTON, DC 20231

SIR:

Transmitted herewith in the above-identified application are:

_X_ **Appeal Brief (In Triplicate)**
___ Declaration and Power of Attorney for Patent Application
___ Assignment of the invention to International Business Machines Corporation
___ Notice to File Missing Parts of Application -- Filing Date Granted
___ No additional fee is required.

The fee has been calculated as shown below:

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR		PRESENT EXTRA	RATE	ADDIT. FEE
TOTAL	8	MINUS	20	=	0	x 18 =	$ .00
INDEP.	2	MINUS	3	=	0	x 78 =	$ .00
	FIRST PRESENTATION OF MULTIPLE DEP. CLAIM					+260 =	$
	(APPEAL BRIEF - FILED IN TRIPLICATE)					Surcharge	$ 300.00
						TOTAL	$ 300.00

_X_ Please charge my Deposit Account No. 09-0466 in the amount of $300.00.
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_X_ Any filing fees under 37 CFR 1.16 for the presentation of extra claims.
_X_ Any patent application processing fees under 37 CFR 1.17.

CERTIFICATE OF MAILING

I hereby certify that the above paper/fee is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Commissioner of Patents and Trademarks, Washington, DC 20231 on
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G. Marlin Knight

Signature G. Marlin Knight

G. Marlin Knight
Registration No. 33,409
Attorney for Applicant(s)
Telephone (408) 256-7104
IBM Corporation
Intellectual Property Law
Dept. L2PA/142
5600 Cottle Road
San Jose, CA 95193

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Practitioner's Docket No. JA9-96-088
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : March 6, 2000
T. Chikazawa et al. : Group Art Unit: 2754
Serial No.: 09/049,861 : Examiner: D. Davis
Filed: 03/27/98 :

Title: **DISK DRIVE DISK WITH LANDING ZONE HAVING TEXTURED AND UNTEXTURED REGIONS**

APPELLANTS' BRIEF (37 CFR 1.192)

Assistant Commissioner for Patents
Washington, DC 20231

Attention: Board of Patent Appeals and Interferences

Dear Sir:

This brief is in furtherance of the Notice of Appeal for the above application, which was mailed to the U.S. Patent and Trademark Office on January 4, 2000.

The fees required §1.17(f) and any required petition for extension of time for filing this brief and fees therefor are dealt with in the accompanying transmittal of appeal brief. This brief is transmitted in triplicate. (37 CFR 1.192(a))

This brief contains these items under the following headings and in the order set forth below:

I. REAL PARTY IN INTEREST

II. RELATED APPEALS AND INTERFERENCE

III. STATUS OF CLAIMS

IV. STATUS OF AMENDMENTS

V. SUMMARY OF THE INVENTION

VI. ISSUES

VII. GROUPING OF CLAIMS

VIII. ARGUMENTS

IX. APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

The final page of this brief bears the attorney's signature.

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines Corporation.

II. RELATED APPEALS AND INTERFERENCE

None.

III. STATUS OF CLAIMS

A. The Application was filed with 12 claims, claims 5-12 remain in the case. All 6 remaining claims have been finally rejected.

B. The Applicants are appealing the rejection of all claims.

IV. STATUS OF AMENDMENTS

All amendments have been entered by the Examiner.

V. SUMMARY OF THE INVENTION

The invention as claimed in the present application is an improved "hard" disk drive (as illustrated Figure 8) on which computer data can be stored. The disk drive has reduced friction when the head/slider 3 lands on or takes off from the surface of the rotating magnetic disk 1. The circumferential area where the head/slider lands, i.e., the landing zone (12 in Figure 1), on the disk is provided with a ring-shaped bump free zone (12b in Figure 2) which faces the area of the slider side of the head/slider (illustrated in Figures 5, 10, 12 and 13) which is lowest in fly height among the air bearing surfaces of the slider. For the slider surface in Figure 5, lowest fly height area 30c is in the center of the rear area of slider. (See page 18, lines 3-10). The landing zone 12 is also formed with at least one ring-shaped bump zone 12a adjacent to the free zone 12b. The bump zone is formed with bumps 12c which are illustrated in section in Figures 3 and 4. The free zone has no bumps. The bumps may be formed by irradiating the disk substrate with laser light. The bump zone 12a may also be provided on both the inner circumferential side and the outer circumferential side of the

free zone as shown in Figure 2. The disk drive is equipped with a landing position control unit (9 in Figure 8) for moving the head/slider so that the minimum fly height area of the head/slider is positioned over the free zone of the disk storage medium when landing the head/slider. (See page 16, line 8 through page 17, line 17). Figure 6 is a diagram showing the pitching angle of the slider during landing. Figure 7 is a diagram showing the rotational speed of the magnetic disk and the fly height of each portion of the slider.

VI. ISSUES

A. Whether the Examiner has properly rejected claims 5-12 as being unpatentable under 35 U.S.C. §102(b) over Ishihara (JP 6-111294) or Matsumura et al. (JP 6-290452) and Sato (JP 5-307748).

VII. GROUPING OF THE CLAIMS

Each claim being appealed is distinct as to the §102(b) issues.

VIII. ARGUMENTS

The Examiner rejected claims 5 and 9 under section 102(b) as being anticipated by Ishihara JP6-111294 or Matsumura, et al., JP6-290452. Claims 5, 7-9 and 11 were rejected under section 102(b) as being anticipated by Sato JP5-307748. Claims 5-12 were rejected under section 102(b) as being anticipated by Samoto JP4-38716.

Ishihara JP6-111294 teaches to use of a pattern of bumps which is claimed to optimize durability of the slider while preventing "attraction" of the slider surface to the disk. Matsumura, et al., JP6-290452 teaches the burning of holes in a carbon substrate. Sato JP5-307748 teaches the formation of bumps on the head parking area which have no sharp angles. Samoto JP4-38716 teaches the use of concentric or spiral groove in the landing zone. Applicants respectfully disagree that these references anticipate the claims as amended above.

Claim 5 which is an independent claim to a disk drive which has a landing zone which includes a "texture free zone" which is used in conjunction with *"a landing position control unit for moving the slider so that the minimum fly height area of said slider is positioned over the free zone of said disk storage medium when landing said slider."* None of the cited references teach the foregoing element of this claim. Method claim 9 has similar provisions and is, therefore, likewise distinguishable.

In the Examiner's remarks applying Ishihara, Matsumura, Sato and Samoto give no specifics other than to state that the references teach "bumps on the disk substrate." (See paragraphs 3, 4 and 5 of the Office Action dated 10-8-99). In paragraph 6, the Examiner stated that the areas between the bumps as taught in the references corresponded to applicants' texture free zone. Applicants respectfully disagree. Applicants' claims 5 and 9 clearly not referring to the area between the bumps as the "free zone." The claim language requires that *"the minimum fly height area of said slider"* to *be "positioned over"* the free zone area when landing said slider, i.e., while the disk is rotating. In claim 5 the "circumferential bump zone" is stated as being "adjacent to said free zone." The area between the bumps does not meet these limitations. The area between the bumps is not a "zone" as used in the claim and it is not "adjacent" to a circumferential bump zone.

Claim 9 as method claim includes the step of "*reducing a rotation rate of the disk to allow a portion of the air bearing surface not having the lowest flying height to contact the textured area of the landing zone first.*" The Examiner's interpretation of the area between the bumps as the free zone clearly does not work. The free zone must be a separate circumferential zone under the lowest flying height area while the disk is rotating to allow another higher area of the slider to contact the textured area first. If the claim is read as the Examiner proposes, a contradiction arises since it is impossible for any other area of the slider other than the lowest flying area to be the first contact point if the free area is commingled with the bump area. If any bumps are passing

under the lowest flying point of the slider as the disk slows down, these bumps will hit the lowest flying area.

All of the claims remaining in the case depend from claims 5 and 9 and, therefore, are similarly distinguishable over the references on the basis given above. However, the dependent claims add significant additional elements which further distinguish over the prior art. For example, claim 6 includes the applicants' teaching that the minimum fly height area is on the inner rail. The references cited by the Examiner have no teaching on this point. Claim 7 includes the applicants' teaching that the bumps have a height above the surface such that the minimum fly height area of the slider does not touch the surface of the disk during landing. Method claims 10 and 11 parallel claims 6 and 7. Claims 7 and 11 further establish the falsity of the Examiner's reading of the "area between the bumps" as the free zone by adding that the minimum fly height area does not touch the surface of the disk during landing. As noted above the bumps will hit the minimum fly height area of the slider if they are commingled with the free area as the Examiner's reading would have it.

Conclusion

Applicants believe that each reference has been distinguished from the applicants' claim language. Thus, all of the claims are believed to be allowable. A reversal of the rejection of the claims under section 102(b) and allowance is respectfully requested.

IX. APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

The text of the claims involved in the appeal are:

5. A disk drive comprising:

a head/slider having an air bearing surface for floating a slider over a rotating disk;

the disk having a disk substrate, a storage medium on at least a portion of a surface of the disk, the storage medium having a storage area for recording data, the disk having a circumferential landing zone on an area of the disk other than said storage area, the circumferential landing zone being partially textured;

the landing zone having a texture free zone which faces a minimum fly height area of the air bearing surface of the slider when the slider is landing and also having a circumferential bump zone adjacent to said free zone, the bump zone being formed with bumps protruding from the surface of said disk, the free zone having no bumps; and

a landing position control unit for moving the slider so that the minimum fly height area of said slider is positioned over the free zone of said disk storage medium when landing said slider.

6. The disk drive of claim 5 wherein the slider has at least an inner and an outer rail with the inner rail being closest to a center of the disk and wherein the minimum fly height area is on the inner rail.

7. The disk drive of claim 5 wherein the bumps have a height above the surface such that the minimum fly height area of the slider does not touch the surface of the disk during landing.

8. The disk drive of claim 5 wherein the bumps have a height above the surface equal to or greater than a difference DH1 between a fly height of a rear end portion of a side rail and a fly height of a rear end portion of the center rail.

9. A method of operating a disk drive comprising the steps of:

rotating a disk under a slider having an air bearing surface and flying the slider over the disk;

positioning the slider over an area on the disk which includes a textured area and an untextured area with the untextured area being under an area on the air bearing surface having a lowest flying height;

reducing a rotation rate of the disk to allow a portion of the air bearing surface not having the lowest flying height to contact the textured area of the landing zone first; and

stopping the disk.

10. The method of claim 9 wherein the slider has at least an inner and an outer rail with the inner rail being closest to a center of the disk and wherein the minimum fly height area is on the inner rail.

11. The method of claim 9 wherein the textured area has a plurality of bumps protruding above a surface of the disk, the bumps having a height above the surface such that the minimum fly height area of the slider does not touch the surface of the disk during landing.

12. The method of claim 11 wherein the bumps have a height above the surface equal to or greater than a difference DH1 between a fly height of a rear end portion of a side rail and a fly height of a rear end portion of the center rail.

Dated: March 7, 2000

Respectfully submitted,

By: _____
G. Marlin Knight (#33,409)
Attorney for Applicants
Phone (408) 256-7104